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of Mexico, and includes also the Pringle and Palmer Mexican collections. To those of us who know of the professional duties of Professor Beal, this large volume comes with a measure of surprise. That he could find time to undertake, and had the persistence to continue the use of his fragments of time long enough to reach this result, speaks well for his devotion to the subject. The author has fully described in these pages 912 species, 809 of which are natives. About 160 new names occur, arising from various causes, forty of them being those of unpublished species, chiefly Mexican.

Analytical keys are quite a feature of this volume, the author doing all in his power to facilitate the work of identification. The usefulness of keys must be tested by a somewhat wide range of use, so that no statement of Professor Beal's success in this regard can be made in advance.

Taking into consideration the shifting of opinions certain to occur during an active period of ten years, the author must have found it very laborious to adapt his work to every new statement of view that investigation proved worthy. It is to be expected that agrostologists will discover numerous things to which exception may be taken, but the writer has discovered, through painful experience, that the making of a manual covering a large area, or a large number of groups, calls for such an immense amount of detail that many things are sure to escape notice until too late to remedy. Professor F. Lamson-Scribner[5] has called attention to some of these with such detail as to make his notice useful as a permanent appendix to the volume.

The book is a great boon to agrostologists, and will stimulate the study of a group neglected out of all proportion to its importance.—J. M. C.

A new text-book and dictionary.

It seems evident that the elementary text-book of botany still remains to be written. The great development of morphology has tended towards excluding from our texts the larger relations of plants. Such taxonomy as is presented is of the sterile, pigeon hole kind, singularly free from evolution, morphology, ecology, geographical distribution, or anything else that gives taxonomy significance. Any indication that an elementary presentation of botany should include a consideration of plants as holding a definite place in nature, as occurring in societies that are determined by many external factors, as bound together by various genetic relationships, as consisting of organs which have an evolutionary history, should be hailed as the promise of better things.

Mr. Willis has prepared a book[6] which should be so regarded. Its pri-

[5] Science **5**: 62. 1897.

[6] WILLIS, J. C.—A manual and dictionary of the flowering plants and ferns. 2 vols. 8vo. Vol. I, pp. xiv + 224. Vol. II, pp. xiii + 429. Cambridge: The University Press; London: C. J. Clay & Sons. 1897. 10*s*. 6*d*.

mary purpose was to provide a compact book which would contain a summary of useful and scientific information about the plants to be "met with in a botanical garden or museum, or in the field." The second volume carries out this idea, and is a regular plant dictionary, containing a vast fund of information concerning the morphology, taxonomy, ecology, economic value, etc., of plants, arranged in the alphabetical order of their Latin names. All of the classes, cohorts, and families are included, and several thousand genera, the more important divisions being treated fully. The second volume, however, necessitated the first, which is really a brief text-book. The topics treated, as well as the motive of their treatment is suggested by the subjects of the four chapters, which are as follows : outlines of the general morphology and natural history of phanerogams and ferns; variation, evolution, classification ; forms of vegetation, geographical distribution of plants, etc. ; economic botany. A cursory examination of the pages shows that the author has brought together the most recent views upon these various subjects, treating them in a broadly philosophical yet simple way. In the chapter upon forms of vegetation and geographical distribution the author has used the same method of treatment as that of Warming in his *Ecological plant geography*, but had developed it independently. From our point of view the first volume is more important than the more extensive and far more laborious second volume, for the latter is a compiled dictionary, exceedingly useful, but the former is a well presented suggestion of a more rational style of text-book. The work is one of the Cambridge Natural Science Manuals.—J. M. C.

The physiology of reproduction.

REPRODUCTION may be reckoned as the last and highest of the life-phenomena of any organism, marking the climax of its development and often the beginning of its decline. It is no wonder, therefore, that reproduction has been much studied, and that classification is so largely based on its structures and phenomena. But most of this study has been devoted to an accumulation of facts regarding the morphology of the organs and the direct method of its accomplishment. Comparatively little is yet known of the physiology of reproduction, and almost nothing of the external conditions by which it is limited.

Using the lower organisms as a starting point, Dr. George Klebs, professor of botany in the University of Basel, has attempted to penetrate this "dark world of reproduction," as he calls it, and has succeeded, in the course of nine years of labor, in making some advance. This has been along the line of determining the conditions under which reproductive bodies, both spores and gametes, are formed.

Enough has been accomplished for the author to plan a work "Ueber die Fortpflanzungs-physiologie der niederen Organismen, der Protobionten," of